

THE UNITED SHATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Research Corporation

Colherens, there has been presented to the

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF SEVENTERN YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT ETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS Y THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

BARLEY

'Wapana'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington this 29th day of October in the year of our Lord one thousand nine hundred and seventy-six

Attost:

Sollin
Commissioner
Plant Variety Protoction Office
Grain Division
Agricultural Marketing Service

Socretary of Agriculture

UNITED STATES DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE GRAIN DIVISION HYATTSVILLE, MARYLAND 20782

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

1. VARIETY NAME OR TEMPORARY	12. KIND NAME		FOR OFFICIAL USE ONLY		
DESIGNATION		2. KIND NAME		PV NUMBER	
WAPANA	BARLEY	BARLEY		023	
3. GENUS AND SPECIES NAME		4. FAMILY NAME (Botanical)		TIME /	
HORDEUM VULGARE	GRAMINAI	H.	19.24.74	4 P.M.	
HONDEOM VOLGARE	GIAMINA	<u></u>	FEE RECEIVED	BALANCE DUE	
•	5. DATE OF DETERM	INATION	\$ 250.00	\$	
	7777 77 1 1			\$	
	JULY 1, 1974		\$ 250	\$	
6. NAME OF APPLICANT(\$)	7. ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP 6. TELEPHONE AREA Code) CODE AND NUMBER				
RESEARCH	405 LEXINGTON AVENUE				
CORPORATION		A.		212/986-6622	
COMPORATION	NEW ION	NEW YORK, NEW YORK 10017			
9. IF THE NAMED APPLICANT IS NOT A P	ERSON, FORM OF	10. STATE OF INCOM	RPORATION	11. DATE OF INCOR-	
ORGANIZATION: (Corporation, partnership, association, etc.)				PORATION	
NON-PROFIT CORPORATION		NEW YO	NEW YORK		
12. Name and mailing address of appli		1		2/26/72* nd receive all papers:	
Norman F. Ob	olon	·	•		
		elland & Maie	r		
Crystal Mall ()ne Suite OOR	Crystal, Sac	are Fine C.	ite 400 Highway Ext 3/19/	
1011 Jofforsor	Davis Highway	100	allege Davis	His human	
Arlington, Vir	rainia 22202	1735 3. 7	gjenens sur as i	Ext 3/19/	
13. CHECK BOX BELOW FOR EACH ATTAC	•	Vasions /Saa Saatis	on 52 of the Plant Va	riety Protection Act)	
X 13A. Exhibit A, Origin and Die	eeding History of the	variety (see section	m 12 of the Flant va	nety I forcesson mess,	
X 138. Exhibit B, Botanical Des	ecription of the Variet	T.			
Eax 4/6/76	cription of the variet	,			
X 13C. Exhibit C, Objective Des	cription of the Variety	v			
<u> </u>		,			
X 130. Exhibit D, Data Indicativ	e of Novelty				
	,				
X 13E. Exhibit E, Statement of the	he Basis of Applicant	's Ownership			
14A. Does the applicant(s) specify the	at seed of this variety	be sold by variety	z name only as a clas	ss of certified seed?	
(See Section 83(a), (If "Yes," a	inswer 14B and 14C bi	elow.)	XYES NO	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
14B. Does the applicant(s) specify th				rations of production	
limited as to number of generation		beyond breed		1	
	X YES NO	FOUNDATIO		X CERTIFIED	
The applicant declares that a viable	sample of basic seed	of this variety wil	I be deposited upon	request before issue	
ance of a certificate and will be rep					
The undersigned applicant(s) of the					
uniform, and stable as required in					
Plant Variety Protection Act.	dection 41 and is enti	tied to protection t	inuer the problems	of Section 42 of the	
•		1 1			
Applicant is informed that false rep	presentation herein ca		· .	na Ities.	
	1 .	Research Con	rporation	1420	
SAT. 19.1979	7	Bayards	RAMAN A		
(DATE)		Barra (S	IGNATURE OF APPLICA		
V /		Baya#d R. H	land , Vice Pr	resident	
·		·		1	
(DATE) *Confirmed by	, lowe of Now V		IGNATURE OF APPLICA	-	
*Commitmed by	laws of New Y	ork Chapter 5	∠s, March 30,	1972	

Exhibit A

Wapana originated in Montana from hand crossed seed of the following pedigree: 'Waxy Oderbrucker'/7*'Compana', F_4 .

The breeding history and description of 'Compana' may be found in Technical Bulletin No. 1224, USDA, Classification of Barley Varieties Grown in the United States and Canada in 1958.

This backcross derived variety of 'Compana' is very similar to 'Compana'. The seed may have about 3% less seed weight than 'Compana' when the two are grown under similar conditions. The variety incorporates the waxy endosperm gene wx wx located on chromosome 1.

The variety is a composite of a number of F_3 lines.

ADDENDUM TO EXHIBIT A

STATEMENT OF TYPE AND FREQUENCY OF VARIANCE DURING REPRODUCTION AND MULTIPLICATION OF VARIETY AND HOW THESE VARIANTS MAY BE IDENTIFIED. EVIDENCE OF STABILITY.

In the backcross seven to Compana F_2 plants were segregated for waxy and non-waxy endosperm. Separation was done in the field by applying IKI solution to freshly cut endosperm cross-sections minimum of 15 seed per plant, as the waxy character expresses xenia. In the absence of amylose the IKI strain remains brown for a short period of time when applied to the cut surface rather than turning purple. The general aspect of all plants was the same as for the recurrent parent Compana. We have observed this material through 7 generations and the waxy character and Compana genotype has been stable.

EXHIBIT B

BOTANICAL DESCRIPTION OF WAPANA BARLEY

Two-rowed semismooth-awned spring barley; early growth erect; plant midseason, short; basal leaf sheaths without hairs, green or faintly purple; upper leaf sheaths waxy, yellow of faintly purple or sometimes slightly black at maturity; auricles rarely purple streaked leaves short, wide, drooping; flagleaves short, wide; stems yellow or sometimes slightly black at maturity; exposed modes green or purple; distance flagleaf to spike 0 to 2 cm., very often the spikes do not emerge from the boot; collars closed; basal rachis internode curved or occasionally straight, 2 to 3 mm long; rachis tough, with long-haired edges; spike lax, midlong, parallet, waxy, erect to inclined; lemma awn long; awns semismooth (tending to be rough at some locations), tips sometimes faintly purple; glume awn equal to length of glume, rough, tips sometimes faintly purple; flumes half the length of lemma, with long hairs covering the glumes or confined to bands; rachilla long haired, abortive in about 30 percent of kernels; lemma yellow, no teeth on lateral nerves and few on marginal nerves, with depression at base; stamens in central florets 3.0 to 3.5 mm long containing good pollen, in lateral florets 0.8 mm long without pollen; stigma moderately hairy; kernels have waxy starch as endosperm, weight 40 to 59 mg (about 97% of Compana); hulls semi-wrinkled to wrinkled.

Wapana barley is slightly less plump and has somewhat more thin kernels than Compana. The average test wieght is about one pound less that that of Compana.

(11-1-7₋)

AGRICULTURE AGRICULTURAL MARKETING SERVICE GRAIN DIVISION HYATTSVILLE, MARYLAND 20782

EXHIBIT C (Barley)

OBJECTIVE DESCRIPTION OF VARIETY

INSTRUCTIONS. See Reverse.

BARLEY (HORDEUM VULGARE)

RESEARCH CORPORATION	FOR OFFICIAL USE ONLY					
RESEARCH CORPORATION ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)	PVPO NUMBER					
405 LEXINGTON AVENUE	7500023					
ROCHESTER, NEW YORK 10017	VARIETY NAME OR TEMPORARY DESIGNATION WAPANA					
Place the appropriate number that describes the appropriate for the second seco						
when number is either 99 or less	or 9 or less.					
I. GROWTH HABIT:						
	th: 1 = PROSTRATE 2 = SEMIPROSTRATE 3 = ERECT					
2. MATURITY (50% Flowering):						
1 * EARLY (California Mariout) 2 = MIDSEASON (Betzes) 3 = LATE (Frontier)					
No. of days harlier than	T 3 ≠ CONQUEST 4 = DICKSON					
No. of days Later than 7) 5 = PIROLINE 6 = PRIMUS 7 = UNITAN						
3, PLANT HEIGHT (From soil level to top of head):						
1 = SEMIDWARF 2 = SHORT (California Mariout) 3 = MEDIUM TALL (Betzes)	4 = TALL (Conquest)					
O G Cm. Shorter than	T 3 = CONQUEST 4 = DICKSON					
Cm. Taller than 5 = PIROLINE 6 = PRIMUS 7 = UNITAN						
4. STEM:						
Exertion: (Flag to spike at maturity): $\frac{1 = 0 - 3 \text{ cm}}{3 = 10 + 15 \text{ cm}}$. Anthocyanin:	1 = ABSENT 2 = PRESENT					
NO. OF NODES (Originating from node above ground)						
Collar Shape: 1 = CLOSED 2 = V-SHAPED 3 = OPEN Shape of Neck 5. LEAF:	1 = STRAIGHT 2 = SNAKY 3 = OTHER (Specify)					
5. LEAF:						
Basal leaf sheath (seedling): 1 = GLABROUS 2 = PUBESCENT Position of flag	t leaf (at boot stage): 1 = DROOPING 2 = UPRIGHT					
3 Waxiness: 1 = ABSENT (Glossy) 2 = SLIGHTLY WAXY 3 = WAXY	H (First leaf below flag leaf)					
1 9 CM. LENGTH (First leaf below flag leaf) Anthocyanin in	leaf sheath: 1 = ABSENT 2 = PRESENT					
6. HEAD:						
Density:	1 = LAX 2 = ERECT (Not dense) 3 = ERECT (Dense)					
Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER (Specify) Waxiness:	I = ABSENT (Glossy) 2 = SLIGHTLY WAXY					
Lateral Kernels Overlap: 1 = NONE 2 = AT TIP 3 = 1/4 - 1/2 OF HEAD Rachis (Hair on	edge): 1 = LACKING 2 = FEW 3 = COVERED					
7. GLUME:						
1 = 1/3 OF LEMMA 2 = 1/2 OF LEMMA 3 = MORE THAN 1/2 OF LEMMA Hairs: 1 = NO	ONE 2 = SHORT 3 = LONG					
Thur covering: 1 = NONE 2 - RESTRICTED TO MIDDLE 3 = CONFINED TO B	AND 4 = COMPLETELY COVERED					
Awns: 1 = LESS THAN EQUAL TO LENGTH OF GLUMES 2 = EQUAL TO LENGTH OF GLUMES 3 = MORE THAN EQUAL TO LENGTH OF GLUMES	TH OF GLUMES					
3 Awa Surface: 1 * SMOOTH 2 * SEMISMOOTH 3 = ROUGH						
Erx 4/5/76 as per letter dated 4/1/26.						
· · · · · · · · · · · · · · · · · · ·	<u> </u>					

FUNIVIGIT-470-5 (Reve	rse)					
8. LEMMA:						
Awn: 1 = AWNLESS 2 = AWNLETS ON CENTRAL ROWS, AWNLESS ON LATERAL ROWS 3 = SHORT ON CENTRAL ROWS, AWNLETS ON LATERAL ROWS 5 = LONG (longer than spike) 6 = HOODED 1 = AWNLESS 2 = AWNLETS ON CENTRAL ROWS, AWNLESS ON LATERAL ROWS 4 = SHORT (less than equal to length of spike)						
Awn Surface: 0 AWNLESS 1 = SMOOTH 2 = SEMISMOOTH 3 = ROUGH						
Teeth: 1 = ABSENT 2 = FEW 3 = NUMEROUS Hair: 1 = ABSENT 2 = PRESENT						
Shape of base. 1 = DEPRESSION 2 = SLIGHT CREASE 2 Racbilla Hairs: 1 = SHORT 2 = LONG						
9. STIGMA:						
Hairs: 1 > FE	N 2 - MANY					
10. SEED:						
Type: 1 - NAKED 2 - COVERED Hairs on Ventral Furrow: 1 = ABSENT 2 = PRESENT						
Length: 1 : SHORT (8.0 mm.) 2 = SHORT TO MIDLONG (7.5 - 9.0 mm.) 3 = MIDLONG (8.5 - 9.5 mm.) 5 = LONG (10.0 mm.)						
Wrinkling of hall: 1 * NAKED 2 - SLIGHTLY WRINKLED 3 = SEMIWRINKLED 4 = WRINKLED						
Aleurone Color:	Aleurone Color: 1 = COLORLESS (White or Yellow) 2 = BLUE					
PERCENT ABORTIVE as per letter. S 5 GMS. PER 1000 SEEDS						
11. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)						
SEPTORIA	NET BLOTCH	SPOT BLOTCH	POWDERY MILDEW			
LOOSE SMUT	BACTERIAL BLIGHT	O COVERED SMUT	FALSE LOOSE SMUT			
STEM RUST	LEAF RUST	O SCAB	O SCALD			
O AY	I BSM∨	BYDV	OTHER (Specify)			
12. INSECT: (0 = Not tested, 1 = Susceptible 2 = Resistant)						
GREEN BUG	ENGLISH GRAIN APHID	CHINCH BUG	ARMYWORM			
2 GRASS HOPPERS	CERIAL LEAF BETTLE	OTHER (Specify)				
HESSIAN FLY R) O D E	O B O C O G				
13. CHEMICAL (0 = Not Tested, 1 = Susceptible, 2 = Resistant)						
О ВВТ	OTHER (Specify)					
14. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:						
CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY			
Plant tillering	Compana	Seed size	NAME OF VARIETY			
Leaf size		Coleoptile elongation	compania			
Leaf color	1)					
Leaf carriage		Seedling pigmentation	1}			

REFERENCES: The following publications may be used as a reference aid for the standardization of character descriptions and terms used in this form:

- 1. Wiebe, G. A., and D. A. Reid, 1961, Classification of Barley Varieties Grown in the United States and Canada
- in 1958, Technical Bulletin No. 1224, U.S. Dept. of Agriculture.

 2. Reid, D. A., and G. A. Wiebe, 1968, Barley: Origin, Botany, Culture, Winter Hardiness, Genetics, Utilization, Pests, Agriculture Handbook No. 338, U.S. Dept. of Agriculture. pp. 61 84.

 3. Malting Barley Improvement Association, Milwaukee, Wisconsin, 1971, Barley Variety Dictionary.

COLOR: Nickerson's or any recognized color fan may be used to determine color of the described variety.

INSTRUCTIONS

11

VFO.

GENERAL: Send an original copy of the application, exhibits and \$250.00 fee to U.S. Dept. of Agriculture, Agricultural Marketing Service, Grain Division, 6525 Belcrest Road, Hyattsville, Maryland 20782. (See Section 180.175 of the regulations and rules of practice.) Retain one copy for your files. All items on the face of the form are self-explanatory unless noted below.

ITEM

- Insert the date the applicant determined that he had a new variety based on the definition in Section 41 (a) of the Act and decision is made to increase the seed.
- 13a First, give the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method. Second, give the details of subsequent stages of selection and multiplication. Third, indicate the type and frequency of variants during reproduction and multiplication and state how these variants may be identified. Fourth, provide evidence on stability.
- 13b First, give any special characteristics of the seed and of the plant as it passes through the seedling stage, flowering stage and the fruiting stage. Second, describe the mature plant and compare it with a similar commercial variety grown under the same conditions, and indicate the differences.
- 13c A supplemental form will be furnished by the PVPO to describe in detail a variety for each kind of seed.
- 13d Provide complete data indicative of novelty. Seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty may be submitted. Seeds submitted may be sterile.
- 13e Indicate whether applicant is the actual breeder, the employer of the breeder, the owner through purchase or inheritance, etc.

ADDENDIM TO EXHIBIT D

Wapana is the only named barley variety with the waxy endosperm gene, \underline{wx} \underline{wx} in a Company genetic background.

ADDENDUM TO EXHIBIT D

SUPPLEMENTAL STATEMENT TO EXHIBIT D AS PER LETTER FROM OBLON, FISHER, SPIVAK, McCLELLAND & MAIER DATED JUNE 9, 1976:

'Wapana' barley is most similar to 'Compana' except it has a waxy endosperm.

Ext 0/14/76

Exhibit E

Applicant is the Assignee of the breeder Dr. Robert F. Eslick who is a professor in the Plant & Soil Science Department of Montana State University.

A copy of the Assignment to Applicant is attached hereto.

Research Corporation

(Name) (Title)
Bayard R. Hand - Vice President

Montana State University

Bozeman, Montana 59715

Tel. 406.587x3421

994-2381

Office of the President
Carl W. McIntosh, President
Wm. A. Johnstone, Vice Pres. for Administration

Roy E. Huffman, Vice Pres. for Research I. E. Dayton, Vice Pres. for Academic Affairs

December 5, 1974

Mr. Norman F. Oblon
Oblon, Fisher, Spivak,
McClelland & Maier
Crystal Mall One, Suite 908
1911 Jefferson Davis Highway
Arlington, Virginia 22202

Dear Mr. Oblon:

This will indicate that the assignment of the barley variety "Wapana" to the Research Corporation by Professor Robert Eslick of Montana State University has the approval of the University. The assignment is made under the terms of an agreement between the Research Corporation and Montana State University with regard to the Patent Application and the Plant Variety Protection Certificate.

Sincerely yours,

Roy E. Huffmai Vice President for Research

REH/mm CC:Robert Eslick Kenneth Goering RJS; ir Proj. 9/13//4 Est

part thereof, or on said application or any divisional, substitute, continuation, renewal, reissue or other patent or other application for protection based -in-whole or -in-part thereon, or based upon said novel variety;

TO BE HELD AND ENJOYED by said RESEARCH, its successors and assigns, to the full ends of the respective terms for which said Certificate of Plant Variety Protection or patents or any of them have been or may be granted as fully and entirely as the same would have been held and enjoyed by said ROBERT F. ESLICK had no sale and assignment of said interest been made;

AND ROBERT F. ESLICK hereby authorizes the Plant Variety Protection Office of the United States of America to issue any and all Plant Variety Protection Certificates which may be granted upon said novel variety or any part thereof, to said RESEARCH;

AND said ROBERT F. ESLICK does agree for himself and his heirs, executors and administrators, to execute without further consideration any further lawful documents and any further assurances, and any divisional, substitute, continuation-in-whole, renewal, reissue, or other applications for plant variety protection certificates or patents of any country that might be

RJS;ir Proj. 9/13/74 Eslick

deemed necessary by said RESEARCH fully to secure to said RESEARCH its interest as aforesaid in and to said novel variety or any part thereof, and in and to said several certificates or patents or any of them and said ROBERT F. ESLICK further agrees to cooperate with RESEARCH in making available such sample or samples of basic seed necessary for propagation of said novel variety as is or may be required by RESEARCH to file for or maintain any such certificates or patents;

AND said ROBERT F. ESLICK does covenant for himself and his legal representatives, and agrees with said RESEARCH, its successors and assigns, that no right or license has been granted to anyone to sell, offer for sale, reproduce, import, export, or use such novel variety in producing (as distinguished from developing) a hybrid or different variety therefrom, and that prior to the execution of this assignment, the right, title and interest in said novel variety had not been otherwise encumbered, and that no instrument in conflict herewith has been executed

Proj. 9/13/74 Eslick

or shall be executed by said ROBERT F. ESLICK.

Executed this 16th day of SEPTENBER 1974.

WENT J. ZSLICK

STATE OF ISONTANA;
COUNTY OF GALLATIN;

RJS:ir

On this day of SEPTEMBEL 1974 personally appeard the above-named ROBERT F. ESLICK, personally known to me and known by me to be the one who executed the foregoing instrument, and subscribed the same in my presence, and acknowledged the same to be his fre act and deed, before me.

My commission expires: August 15,1975

Page 4 of a 4-page assignment from ROBERT F. ESLICK to RESEARCH CORPORATION

ASSIGNMENT

WHEREAS, ROBERT F. ESLICK of Bozeman, State of Montana, is the breeder of a novel variety of sexually reproduced plant who has so reproduced said variety designated WAPANA variety of barley; and

WHEREAS, RESEARCH CORPORATION, a New York not-for-profit corporation with offices at 405 Lexington Avenue, New York, New York 10017, and herein termed "RESEARCH", is desirous of acquiring certain rights in and to said novel variety;

NOW, THEREFORE, in consideration of one dollar in hand paid and other good and valuable consideration by RESEARCH to said ROBERT F. ESLICK, the receipt of which is hereby acknowledged, said ROBERT F. ESLICK has agreed to and by these presents does hereby sell, assign and tranfer unto said RESEARCH the entire right, title and interest in and throughout the United States of America (including its territories and dependencies) and all countries foreign thereto, in and to said novel variety, including the right to apply to the United States Plant Variety Protection Office of the Department of Agriculture for a Certificate of Plant Variety Protection therefor, and any and all corresponding certificates for protection in any other country, and in patents (including extensions thereof) of any country, which have been or may be granted on said novel variety or any